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THE Be-Hg (BERYLLIUM-MERCURY) SYSTEM

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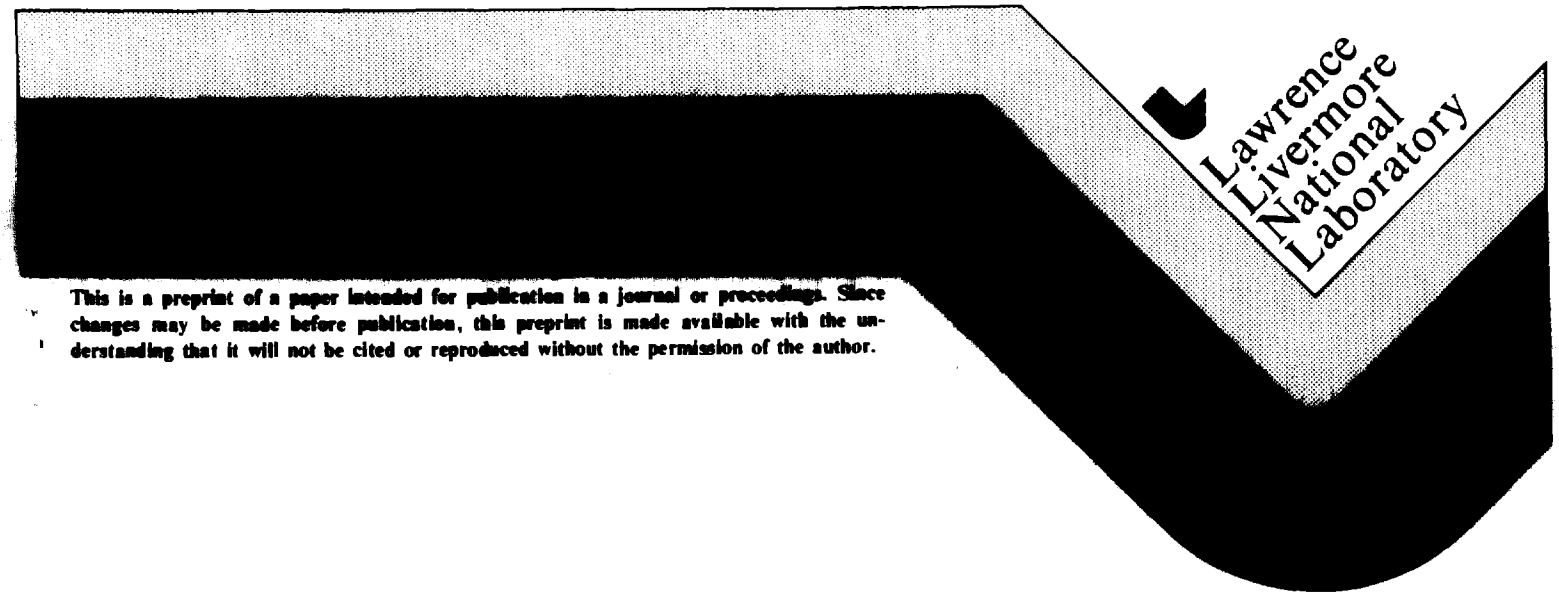

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To date there has been no additional information about the Be-Hg system other than that cited in [Hansen] and [Elliott].

Be seemed to be insoluble in liquid Hg [26Bod, 56Str]. Very limited solubility was observed by [50Kel] as follows:

Temperature, °C	Composition, $x10^{-4}$ at.% Be
800	8.9
100	0.22

The melting point of (βBe) and the (βBe) --> (αBe) allotropic transformation temperature are 1289±4 and 1270±6 °C, respectively [85BAP]. The melting point of Hg is -38.836 °C [Melt].

[57Kel, 58Hol] prepared an amalgam of Be by electrolyzing a NaCl-$BeCl_2$ fused salt mixture into a Hg cathode. By analogy with the Hg-Mg system, it was speculated that the compound $BeHg_2$ was formed.

A summary of crystal structure and lattice parameter data is given in Table 1.

Table 1 Be-Hg Crystal Structure and Lattice Parameter Data

Phase	Composition, at.% Hg	Pearson symbol	Strukturbericht designation	Space group	Prototype	Lattice parameters, nm a	c	Reference
(βBe)	0	cI2	A2	Im$\bar{3}$m	W	0.25515	...	[King2]
(αBe)	0	hP2	A3	$P6_3/mmc$	Mg	0.22857	0.35839	[King1]
$BeHg_2$	66.7	?	?	?	?	?	?	[57Kel]
(αHg)	100	hR1	A10	R$\bar{3}$m	Hg	0.3005	α=70.53°	[King1]

General References

[Hansen]: M. Hansen and K. Anderko, Constitution of Binary Alloys, McGraw-Hill, New York or General Electric Co., Business Growth Services, Schenectady, NY 12345 (1958)

[Elliott]: R.P. Elliott, Constitution of Binary Alloys, First Supplement, McGraw-Hill, New York or General Electric Co., Business Growth Services, Schenectady, NY 12345 (1965)

[Melt]: "Melting Points of the Elements," Bull. Alloy Phase Diagrams, 2(1), 145-146 (1981)

[King1]: H.W. King, "Crystal Structures of the Elements at 25 °C," Bull. Alloy Phase Diagrams, 2(3), 401-402 (1981)

[King2]: H.W. King, "Temperature-Dependent Allotropic Structures of the Elements," Bull. Alloy Phase Diagrams, 3(2), 275-276 (1981)

Cited References

26Bod: S. Bodforss, "The Electrochemistry of Beryllium," Z. Phys. Chem., 124, 66-82 (1926). (Equi Diagram; Experimental)

50Kel: L.R. Kelman, W.D. Wilkinson, and F.L. Yaggee, "Resistance of Materials to attack by Liquid Metals," ANL-4417, 66-67, Argonne national Labotatory, July (1950). (Equi Diagram; Experimental)

56Str: J.F. Strachan and N.L. Harris, "The Attack of Unstressed Metals by Liquid Mercury", J. Inst. Met., 85, 17-24 (1956). (Equi Diagram; Experimental)

57Kel: M.C. Kells, R.B. Holden, and C.I. Whitman, "The Preparation of Beryllium Amalgam," J. Am. Chem. Soc., 79(14), 3925 (1957). (Equi Diagram; Experimental)

58Hol: R.B. Holden, M.C. Kells, and C.I. Whitman, "Continuous Electrolytic Process for the Preparation of Beryllium Metal," Proc. U.N. Intern. Conf. Peaceful Uses At. Energy, 2nd, Geneva, vol. 4, 306-308 (1958). (Equi Diagram; Experimental)

85BAP: to be published in Bull. Alloy Phase Diagrams, (1985). (Equi Diagram; Compilation)

Acknowledgments

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